

PATENT COOPERATION TREATY

Rec'd PCT/PTO 28 DEC 2004

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

ING. B. & Z. Milano

27 FEB. 2004

~~PCT~~

To:

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NOTIFICATION OF RECEIPT
OF DEMAND BY COMPETENT INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))Date of mailing
(day/month/year)

20-02-2004

Applicant's or agent's file reference
Cal 86554

IMPORTANT NOTIFICATION

International application No.

PCT/EP03/07752

International filing date (day/month/year)

16/07/2003

Priority date (day/month/year)

19/07/2002

Applicant

BERCO S.p.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

12/02/2004

2. This date of receipt is:

- the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
 the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
 the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. **ATTENTION:** That date of receipt is after the expiration of 19 months from the priority date. Consequently, in respect of some Offices, the demand does not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)) and the acts for entry into the national phase must therefore be performed within 20 months from the priority date (or later in some Offices). However, in respect of some other Offices, the time limit of 30 months (or later) may nevertheless apply. See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

- (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/

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(17/02/2004)



INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Rec'd PCT/PTO 28 DEC 2004

Applicant's or agent's file reference Cal 86554	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/07752	International filing date (day/month/year) 16.07.2003	Priority date (day/month/year) 19.07.2002
International Patent Classification (IPC) or both national classification and IPC B62D55/30		
Applicant BERCO S.p.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
 - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.
3. This report contains indications relating to the following items:
 - I Basis of the opinion
 - II Priority
 - III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV Lack of unity of invention
 - V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI Certain documents cited
 - VII Certain defects in the international application
 - VIII Certain observations on the international application

Date of submission of the demand 12.02.2004	Date of completion of this report 21.06.2004
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Spinelli, V Telephone No. +49 89 2399-2903



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/07752

I. Basis of the report

- With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-4, 6-24	as originally filed
5, 5a	received on 27.05.2004 with letter of 26.05.2004

Claims, Numbers

1-11	received on 27.05.2004 with letter of 26.05.2004
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Drawings, Sheets

1/3-3/3	as originally filed
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- With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

- With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
 - contained in the international application in written form.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority in written form.
 - furnished subsequently to this Authority in computer readable form.
 - The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
- The amendments have resulted in the cancellation of:
 - the description, pages:
 - the claims, Nos.:
 - the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/07752

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP03/07752

Part V.

- 1.1 A track-tightening device for crawlers, according to the preamble of claim 1, is disclosed in document D1=US-A-3 826 325 wherein (see fig.1-5 and column 2, lines 44-67 and column 5, lines 26-36) said device 14 comprises an undercarriage consisting of a structure 16,18 including elements 22, 26, 28, 38, 42, 44, 72, 74 for carrying the lower supporting rollers 76, 78, 84, 86, the idler back-pull wheels 46, 30 and a crawler wheel 56, said track-tightening device carried by an associated structure to retract together by means of a recoil system, wherein end 16 be separated and movable towards and away from end 18.
Document D1 additionally describes said associated movable structure 16, 18 as carrying at least one movable supporting roller 32, 36, 48, 52, capable of following the longitudinal movement of the idler wheel 30, 46, and always remaining at the same distance therefrom under any operating condition and with any range of the track-tightening device.
- 1.2 The further features of claim 1 are not part of the available state of the art, as requiring that said at least first movable supporting roller be integral with the idler wheel so that reciprocal distance does not vary during the operating life of the vehicle: such a performance fulfills the stated object of the application, i.e. of maintaining and regulating the tension established in the track while the machine is running so as to absorb the tension due to the intrusion of a foreign body.
The integrality of the first movable supporting roller with the idler wheel allows the idler wheel finding the immediate support of the supporting roller with the track having a minimum length of non-supported section, further not creating a significant concavity under conditions of major stress.
- 1.3 The finding claimed by principal clause 1 is new and also inventive with respect to prior art, solving the problem of a tension overload on the track and a parallel increase in stress on all the other associated mechanical units (Art.33(1-4) PCT).
2. The combination of the features of dependent claims 2 to 11 is neither known from, nor rendered obvious by, the available prior art and represent optional embodiments of the track-tightening device claimed by principal clause 1; as such corresponding claims 2 to 11 also meet the requirements of the PCT with respect to a novelty and inventive step, are in accordance with Art.33(1-4) PCT conditions.

This form of embodiment, with rollers capable of oscillating, tends to cause a more complete faying surface of the track/ground contact point, on which the vehicle must move, with an improved traction/thrust capacity of 5 the crawler. This type of arrangement of the supporting rollers 2 is normally defined as "floating bogie". <52>

A series of soles or skids 4 is applied to the chain 1, which can be of various kinds and which must ensure both adherence to the ground to transmit the tensile 10 strength and also the distribution and sustenance of the weight of the crawler on the ground. The shock absorber-tightening group 5 is connected to the axis of the front wheel 3, opposite the crawler wheel. This general scheme shows a traditional track-tightening device in which the 15 idler wheel 3 is assembled on supports 8 which allow it to move in a longitudinal direction with respect to the undercarriage structure, the elastic shock absorber 9 is indicated as a propeller spring which operates under compression and a tightener as a grease cylinder 10. For the 20 tightening and shock absorbing function, spring, oleodynamic, pneumatic devices have been proposed and also grease, floating piston devices integrated with each other by means of various structure either separate or integrated with each other each time, with solutions 25 which satisfy all the individual performance requirements

<A truck suspension assembly of this kind is known from US-A-3 826 325.

In US-A-3 826 325 the track frame of a vehicle is pivotally mounted to the vehicle main frame and has
5 crank members pivotally mounted to the opposite ends of the track frame. Each crank member has mounted thereon an idler and a bogey to which is fixed a pair of track rollers. These idlers and track rollers are engaged by a continuous track chain, and the track
10 frame is supported at the crank member-track frame pivot points by means of the idlers and track rollers. Stop members and resilient pad means are associated with the crank members, link members, and track frame for proper support of the track frame.>

CLAIMS

1. A track-tightening device for crawlers, comprising an undercarriage or bogie consisting of a structure (20) which includes elements (21) for carrying the lower supporting rollers (2), as well as the idler back-pull wheels and possibly also the crawler wheel, said structure (20) housing a guide system (25) for the controlled axial sliding of the track-tightening device (5) carried by a structure (8) equipped with fittings (26) with the guides (25) and supporting the idler wheel (3) to modify the wheel base of the front and back wheels of the bogie, characterized in that the movable structure (8) also carries at least one movable supporting roller (22), capable of following the longitudinal movement of the idler wheel (3), always remaining at the same distance therefrom characterized in that said at least the first of said movable supporting roller (22) is integral with the idler wheel (3) so that the reciprocal distance does not vary during the operating life of the vehicle, under any operating condition and with any range of the track-tightening device.
2. The track-tightening device for crawlers according to claim 1, characterized in that the movable structure (8) carries two or more movable supporting rollers (22).
- 25 3. The track-tightening device for crawlers according

to claim 2, characterized in that the movable structure (8) carries two or more movable supporting rollers (22) with a floating bogie arrangement.

4. The track-tightening device for crawlers according
5 to claim 1, characterized in that the idler wheel (3) is installed on the bogie in a front position.

5. The track-tightening device for crawlers according to claim 1, characterized in that the movable supporting rollers have the same structure and dimensions as the
10 fixed supporting rollers (2).

6. The track-tightening device for crawlers according to claim 1, characterized in that the movable supporting rollers (22) have different structure and dimensions than the fixed supporting rollers (2).

15 6. 7. The track-tightening device for crawlers according to claim 1, characterized in that the track-tightener (5) is activated with a tightener/shock absorber group (30) which comprises a helicoidal spring (36), which operates in extension, and a chamber (38)
20 filled with the injection of a lubricant which acts as an adjustable run end and tightener of the chain (1) of the track.

7. 8. The track-tightening device for crawlers according to claim 6 7, characterized in that the tightener/shock absorber group (30) comprises calibration

means of the longitudinal position of the fixed shoulder (34) of the helicoidal spring (36) with respect to the structure (20) of the undercarriage.

8. 9. The track-tightening device for crawlers according to claim 6 7, characterized in that the tightener/shock absorber group (30) comprises a cylindrical telescopic guide (31/32) coaxial with the helicoidal spring (36) and with the lubricant injection chamber (38).

10. 9. 10. The track-tightening device for crawlers according to claim 6 7, characterized in that the tightener/shock absorber group (30) comprises a helicoidal spring (36) and with the lubricant injection chamber (38) separate and arranged in series on the same axis.

15. 10. 11. The track-tightening device for crawlers according to claim 6 7, characterized in that the tightener/shock absorber group (30) comprises a helicoidal spring (36) and with the lubricant injection chamber (38) separate and arranged on parallel axes.